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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/529,249	09/01/2005	Abbas Razavi	F-861 (31223.00078)	4021
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FINA TECHNOLOGY INC				
PO BOX 674412				
HOUSTON, TX 77267-4412				
EXAMINER				
LET, RIP A				
ART UNIT		PAPER NUMBER		
1796				
MAIL DATE		DELIVERY MODE		
02/21/2008		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/529,249

Applicant(s)

RAZAVI, ABBAS

Examiner

RIP A. LEE

Art Unit

1796

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 January 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 21, 23-27 and 31-41 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 21, 23-27 and 31-41 is/are rejected.
- 7) ☒ Claim(s) 21 and 39 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

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DETAILED ACTION

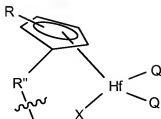
This office action follows a request for continued examination (RCE) under 37 § C.F.R. 1.114, filed on January 2, 2008. Claims 21, 23-27, and 31-41 are presented for examination.

Claim Rejections - 35 USC § 112

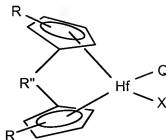
1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 21, 23-27, and 31-41 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The structure of the first constituent of the instant claims remains vague and indefinite. The claim is drawn to a hafnocene having the general structure defined as $R''(\text{CpR}_n)_g\text{Hf}(\text{X})(\text{Q})_{3-g}$ where R'' is a structural bridge between *two* Cp rings (line 14 of claim 21 and line 15 of claim 39). The claim also states that g is 1 or 2 (line 18 of claim 21 and line 19 of claim 39). It is noted that where there are two Cp rings, g can not equal unity. Furthermore, if g does equal 1, the R'' does not link two Cp rings, as defined, and the structure is incomplete (structures provided below for clarity). From claim 23, which recites “each cyclopentadienyl,” it appears that Applicant intends to describe a compound containing two (CpR_n) ligands, i.e., $g = 2$.



$g = 1$, hafnium compound contains two Q and one X; structure is incomplete



$g = 2$, hafnocene contains one Q and one X

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3. Claims 21, 23-27, and 31-41 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The value of integer n , corresponding to substituent R, has not been defined.

4. Claims 21, 23-27, and 31-41 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claim is drawn to a second constituent that is an unbridged metallocene or a post-metallocene component that is effective for producing a low molecular weight fraction. There are hundreds, if not thousands, of unbridged metallocene complexes which satisfy this general description, and among this multitude of metallocene, it is not clear which would be suitable and effective in producing a low molecular weight fraction. The identity of the post-metallocene is much less clear. Whereas metallocenes contain the art-recognized general structure of two π -ligands, the term post-metallocene conveys the sole information that it contains a metal in, but not limited to, groups 8-10. The structure of the supporting and ancillary ligands is not known from the claim, and therefore, it is not clear what type of compound is being claimed. And among an infinite set of post-metallocene compound, it is less clear which are suitable and effective in producing a low molecular weight fraction. In light of these facts, it is deemed that the nature of the catalyst is ill-defined, and accordingly, the process of using the catalyst is also ill-defined. Therefore, the subject matter of the instant claims, without qualification, is vague and indefinite.

Claim Rejections - 35 USC § 102 / 35 USC § 102

5. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

6. Claims 21, 24-27, 32-41 are rejected under 35 U.S.C. 102(e) as being anticipated by, or in the alternative under 35 U.S.C. 103(a) as obvious over Canich *et al.* (U.S. 6,194,341).

Canich *et al.* discloses a process for polymerization of olefin(s) in the presence of a mixed transition metal catalyst system comprising one late transition metal component and one early transition metal component. The early transition metal component is $\text{Me}_2\text{Si}(\text{N-}t\text{Bu})(\text{C}_5\text{Me}_4)\text{TiX}_2$, where $\text{X} = \text{Cl, Me}$ (col. 6, lines 8-10). This corresponds a compound of formula (II) in which $g = 1$, R'' is a structural bridge that connects one (CpR_n) ligand with heteroatom ligand X , where $\text{X} = \text{N}$. The activator contains a non-coordinating borate (col. 9 and 10; col. 21, lines 41-45); organoaluminum co-catalyst is disclosed in col. 11, lines 10-14). Use of supports is disclosed in columns 11 and 12; commercially available silica having a pore volume of 1.66 mL/g is prescribed (col. 23, line 3). In theory any ratio of transition metal catalyst can be used; the preferred ratio is 200:1 to 1:1 (col. 6, lines 50-54). The molecular weight distribution of polymer product is broadened and bimodal (col. 19, lines 26-30), with the weight average molecular weight of the high molecular weight fraction is 1.5-25 times greater than weight average molecular weight of the low molecular weight fraction (col. 19, lines 40-52). The reference is silent regarding the value of weight distribution using catalyst containing $\text{Me}_2\text{Si}(\text{N-}t\text{Bu})(\text{C}_5\text{Me}_4)\text{TiX}_2$, however, a reasonable basis exists to believe that the polymer product exhibits the claimed feature, especially in light of the fact that the polymer is produced with substantially the same process and catalyst recited in the instant claims. Since the PTO can not conduct experiments, the burden of proof is shifted to the Applicants to establish an unobviousness difference. *In re Fitzgerald*, 619 F.2d. 67, 205 USPQ 594 (CCPA 1980). See MPEP § 2112-2112.02. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977).

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7. Claims 21-27 and 32-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Loveday *et al.* (U.S. 6,248,845).

Loveday *et al.* teaches a process for polymerization of olefin(s) in the presence of a catalyst containing a substituted hafnocene of formula (III) where the two cyclopentadienyl rings $C_5H_{5-d,i}R''_d$ are bridged with a covalent bridging group R''' , and Q which can be the same or different is halogen, hydrocarbyl, alkoxide, aryloxide, amide, phosphide (col. 4, line 52-col. 5, line 5). Note that compounds in which both Q are alkoxide or aryloxide satisfy the structural features of the instant claims such that Q of formula (II) is hydrocarboxy [*sic*] having 1-20 carbon atoms, and X is a heteroatom ligand containing oxygen. Catalysts are prepared using a borate activator (col. 7, lines 5-16). Supports are disclosed in column 8, lines 42-67, wherein the preferred support is silica having a surface area of up to 700 m²/g and pore volume of 0.5-3.5 mL/g. In one embodiment of the invention, the hafnocene is used as a first component in a dual catalyst system. The second component is an early metal metallocene complex (col. 7, lines 54-67) or a post-metallocene (col. 8, lines 24-42). Although Loveday *et al.* does not prescribe a limiting ratio of first and second catalyst components, it is the examiner's position that the relative ratio of metal complexes is a result-effective variable (MPEP 2144.5) since the amounts used clearly affects the distribution of polymer product. Hence, the choice of a particular amount of each component, such as the amount in present claims 36-38, and in particular, about 50 % (*i.e.*, a 1:1 ratio) of each component, is a matter of routine experimentation and would have been well within the skill level of, and thus obvious to, one of ordinary skill in the art. And while the reference does not disclose information about the molecular weight and molecular weight distribution of product, a reasonable basis exists to believe that the polymer product exhibits the claimed features, especially in light of the fact that the polymer is produced with substantially the same process and catalyst recited in the instant claims. Since the PTO can not perform experiments, the burden is shifted to the Applicants to establish an unobviousness difference. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). *In re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990).

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Claim Objections

8. Claims 21 and 39 are objected to because of the following informalities: In the definition of substituent Q, it appears that “hydrocarboxy” should be replaced with “hydrocarbyloxy.” Appropriate correction is required.

9. Claims 21 and 39 are objected to because of the following informalities: The definition of X is unnecessarily verbose. The last phrase defines the heteroatom in X as N, P, O, or S, which implies that the heteroatom is in group VA or VIA and contains 1 or 2 lone pairs of electrons. The description may be written succinctly as “X is a heteroatom ligand wherein the heteroatom is nitrogen, phosphorus, oxygen, or sulfur.” Appropriate correction is required.

10. Claims 21 and 39 are objected to because of the following informalities: It is not clear based on the instant specification how a borate activating agent differs from a boronate activating agent.

Response to Arguments

11. The rejection of claims over Canich *et al.* (U.S. 6,194,341) in view of Winter *et al.* (U.S. 5,679,811), set forth in the previous office action dated September 4, 2007, has been withdrawn.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rip A. Lee whose telephone number is (571)272-1104. The examiner can be reached on Monday through Friday from 9:00 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu S. Jagannathan, can be reached at (571)272-1119. The fax phone number for the organization where this application or proceeding is assigned is (571)273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <<http://pair-direct.uspto.gov>>. Should you have questions on the access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll free).

/Rip A. Lee/
Examiner, Art Unit 1796

February 15, 2008